

**A REPORT PERTAINING TO CRITERIA 6:
MAINTENANCE AND ENHANCEMENT OF LONG-TERM
MULTIPLE SOCIOECONOMIC BENEFITS TO MEET THE
NEEDS OF SOCIETY**

MONTREAL PROCESS

Indicators 35-37 and 42-43.

**Recreation, Tourism, and Other Social, Cultural, and Spiritual
Values**

FOR

**2003 NATION'S REPORT ON SUSTAINABLE FOREST
MANAGEMENT: UNITED STATES**

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Preamble

Following an international seminar in Montréal, Canada, in 1993, which focused on sustainable forest management, it was agreed that a system of criteria and indicators to monitor the status of temperate and boreal forests was needed. The system settled on included 7 criteria and 67 indicators intended to measure a variety of forest conditions and outputs resulting from forest management. In addition to the United States, other countries in North and South America, Asia and the Pacific Rim collaborated to develop this criteria and indicator system through a process now known as the Montréal Process. The seven criteria identified by the Montréal Process include vital forest ecosystem functions and attributes (biodiversity, productivity, forest health, the carbon cycle, and soil and water protection), socioeconomic benefits (timber, recreation and cultural values) and the institutions through which forest management functions or is influenced.

Indicators for Criteria 6, “Maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of society,” cover a number of benefits from commodity to noncommodity. Outdoor recreation and cultural/social/spiritual benefits are two of the broadly defined noncommodity benefits. Three indicators were identified to measure management of forests for to provide recreation capacity and benefits, and two were identified to measure cultural, social and spiritual benefits. In the United States, recreation and other social benefits seem to be growing in significance relative to other multiple benefits of forests.

The Indicators Defined

Outdoor recreation is an important basis for tourism and is a highly significant and growing social benefit from forest management. There are three indicators that pertain to forest recreation as defined by the Montreal Process. They and their importance are described below:

Land Area (Indicator 35): This indicator shows the degree to which forests are accessible to the populace for recreation activities. It is essential that both public and private forest land are open for outdoor recreation if the full spectrum of multiple socioeconomic benefits are to be realized from the Nation’s forests. Outdoor recreation is growing in popularity across all segments of the Nation’s population and increasingly is a highly significant component of people’s lifestyles. Very significant sectors of the U.S. economy depend on steadily growing recreation markets for consumption of their services and goods and readily available forest lands are essential for this growth.

Facilities (Indicator 36): This indicator shows the degree to which forests have been developed or otherwise made more useable for recreation activities. While it is essential to have forest land open for outdoor recreation (Indicator 35), it is also essential that access and facilities are provided to accommodate a wide range of activities and people’s physical abilities. Facilities on private land are especially important in the populated East and will become more important as our population becomes more urban and older. Activities that depend on roads, trails, and developed sites have been growing in popularity among all segments of the U.S. population. As well, very significant sectors of the U.S. economy depend on steadily growing recreation markets for their services and goods. Readily available outdoor facilities support this growth.

Use (Indicator 37): This indicator shows use of forest lands and facilities for outdoor recreation. It is a measure of the outcome or realized benefit from forest lands and facilities accessible for outdoor recreation. The most widely accepted modern measures of use are a “recreation visit” (an occasion whereupon one person enters land, a site or facility for one or more recreational activities of any duration), “participation” (one or more persons participating any number of times in an activity during a specified period of time), and “activity days” (the number of different days on which a person participates in an activity during a specified period of time, usually 12 months). Increases or decreases in any of these measures for an activity indicate a change in supply of opportunities (access or facilities) and/or a change in demand. These measures are important because they indicate the size of the market for activities and thus demand for the services, facilities, equipment, and land related to activities. Overall societal welfare and the health of a number of sectors of the country’s economy are closely linked.

In addition to outdoor recreation and tourism, other social, cultural and spiritual needs and benefits come from forests. In fact, these benefits seem to be increasingly valued by the American public as wild places become more scarce. The two Montreal Process indicators that address these values include:

Protected Land (Indicator 42): This indicator is intended to measure the amount of forest land placed under the range of tenure classifications and/or management/protection regimes that are specifically designed to protect cultural, social and/or spiritual values, including land formally recognized as being under indigenous tenure. It recognizes the cultural and spiritual connections of society to forests that go beyond commercial or livelihood values. It excludes forests owned and/or managed for private or commercial purposes, and includes all known forest lands designated to serve public purposes to some extent, which implies recognition in management of social, cultural and/or spiritual values. Over the last several decades, there is evidence that American society has been attaching greater value to natural forests, even as most, more than 80 percent of people in this country live in urban environments (Tarrant and Cordell 2002). This indicator helps monitor the degree to which forest management recognizes public needs and values, beyond private economic gains.

Values (Indicator 43): This indicator is intended to measure nonconsumptive uses and values of forests. It acknowledges any uses that do not result in the physical removal or destruction of natural forest materials. Included are onsite uses, such as recreation and educational activities, and offsite values, such as ecological services, scenery, or existence values. Direct data sources are limited, but measuring nonconsumptive forest uses and values is highly important since recreation and other nonconsumptive and noncommodity uses seem to be rising in interest among Americans. Knowing the magnitude and trends in nonconsumptive uses and values is necessary to guide balanced forest management on both public and private lands.

Current Status and Trends in Recreation and Tourism in the United States—Indicators 35-37

Outdoor recreation and tourism have been steadily rising in importance as a forest use and value in the United States for several decades (ORRRC 1962 and Cordell 2002). Establishing a baseline and then monitoring whether a flow of opportunities for forest-based outdoor recreation is being sustained or improved as a result of forest management policy and practice, therefore, is highly important. Following is the United States' report for 2003 on three indicators specified by the Montreal Process covering the supply and use of the Nation's public and private forests for recreation.

Indicator 35. Area and percent of forest land available for general recreation and tourism, in relation to the total area of forest land.

The distribution of forest lands across different categories of owners varies widely from region to region. The majority of forest land in the East is in private ownership while the majority in many parts of the West is in public ownership. These ownership patterns are significant because greater proportions of public land than private land are available to the general public for recreation. For all regions, practically all forest land in public ownership is available to anyone wishing to use it for recreation. Access to industrial forest lands is limited to persons with lease or other exclusive access privileges, but almost all industrial land is open at some level. Total area of public and industrial forest land has remained relatively constant over the last 20 years, as have access policies concerning them. Thus the trend in area of public and industrial forests available for recreation has been relatively flat.

Because public and industrial forest land area is relatively constant over time and almost all of it is open for recreational use, it is nonindustrial private forest land that is the major contributor to increases or decreases in total area available for recreation uses. Nonindustrial private forest land in the United States is vast and lies mostly in the East. Most nonindustrial forest land is accessible, but only so to a limited number of people, mainly family, friends or others associated with the owners or to people who lease access rights. A smaller portion is available to any one whether known by the owner or not. The percentage of nonindustrial land open exclusively to owners, friends, or lessees added to that which is open inclusively to anyone, whether connected to the owner or not, was lowest in the South (68.2 percent), highest in the West (80.7 percent), with the North trailing the West slightly at 79.9 percent (Table 35.1).

Table 35.1. Estimated percent of private nonindustrial forest land available for recreation by region of the United States, 2002

Region	North	South	West	U.S. Total
Percent of total private forest area	79.9	68.2	80.7	74.9

Sources: Smith et al. 2001 and National Survey on Recreation and the Environment, 2000-2001.

The emphasis of this indicator is on forest land accessible for recreation, whether or not that access is limited to an exclusive few, such as family or friends. But it is important to track also private forest land accessible to the outside general public. Percentages of nonindustrial land available inclusively, i.e., including the “outside public,” are much lower than the percentages accessible as reported just above. Typically, 15 to 20 percent of ownerships have allowed unlimited public access in past years (Cordell 1999). This percentage, however, has been trending downward steadily over the last several decades. In 1985–86, nearly 25 percent of owners permitted some public access. This percentage dropped by 1995 to nearly 14.5 percent (Cordell 1999). In 2000–01, only 10.9 percent of owners were estimated to permit unlimited access to the general public. Lowest percentage was in the West at 8 percent and highest was in the North at 13 percent.

Nationally, there are an estimated 749 million acres of forest, about 33 percent of the total U.S. land area (Smith et al. 2001, Table 2. Updated 2002 data is available on the World Wide Web at www.ncrs.fs.fed.us/4801/fiadb/rpa_table/Draft_RPA_2002_Forest_Resource_Tables.pdf).

Final estimates of forest land area available for recreation and percent by ownership category are presented in Table 35.2 for the four regions and for the United States overall. Of total forest area in the United States, 643 million acres, or about 86 percent, is available for outdoor recreation by someone, inclusively or exclusively. Because so much of the forest in the South is nonindustrial private, this region has the lowest recreation availability at 71 percent. The public-land-rich Rocky Mountain/Great Plains region has the highest percentage of forest available for recreation at almost 95 percent. More than two of every five acres of forest available for recreation in the United States is privately owned, with Federal land close behind at 39 percent.

By region, forest area available for recreation varies considerably (Table 35.2).

- In the North, a region ranging from Minnesota to Missouri to Delaware to Maine, nearly 2/3 of the 144 million acres of forest available for outdoor recreation (an area approaching the land area of Texas) is in nonindustrial private ownership (almost 91 million acres). Federal land comprises only about 10 percent of this area, mostly including national forests and national parks. State and local government land is about 19 percent, 27.6 million acres.
- In the South, a region stretching from Texas and Oklahoma to Virginia and south to Florida, more than 153 million acres of forest are available for recreation. More than 2/3 of this area is in nonindustrial private ownership, another 16 percent is in industrial ownership. About 16 percent (around 24 million acres) is publicly owned, almost 3/4 of which is Federal. National forests make up the majority of the Federal land in the South.
- In the Rocky Mountain/Great Plains Region, including States, from Idaho to Arizona and New Mexico to North Dakota, almost 3/4 of the 137 million acres of the recreation accessible forest area (an area approximately the size of California plus Alabama) is federally owned (73 percent). Other public lands, plus forest industry lands, make up a relatively minor portion of the forest land in this region that is available for recreation. Nonindustrial ownerships contribute just under 21 percent, mostly in the Great Plains portion of the region.

- In the Pacific Coast region, California to Alaska, and including Hawaii, is found the greatest area of forest available for outdoor recreation, much of it due to the presence of Alaska's vast Federal ownership. This land area exceeds the land mass of Texas by nearly 10 million acres. Federal land makes up 58 percent of this region's total forest recreation land. Seventeen percent of this available forest area is owned by nonindustrial owners, who make about 36 million acres available.

Table 35.2. Forest land area in the United States available for recreation by ownership category and region, 2002 (thousands of acres and percent of regional or national total that is available)

Ownership	North	South	Rocky Mtns	Pacific Coast	U.S. Total Available
All Federal land	13,740 9.5%	17,848 11.7%	100,089 73.1%	121,508 58.1%	253,185 39.4%
State & local government	27,578 19.2%	5,902 3.9%	6,029 4.4%	41,382 19.8%	80,891 12.6%
Forest industry	11,847 8.2%	24,482 16.0%	2,362 1.7%	10,259 4.9%	48,950 7.6%
Nonindustrial private	90,712 63.0%	104,832 68.5%	28,489 20.8%	36,069 17.2%	260,102 40.4%
All owners (Percent of total forest available)	143,877 (84.8%)	153,064 (71.3%)	136,969 (94.9%)	209,218 (95.0%)	643,128 (85.9)

Source: Smith et al. 2001 and National Survey on Recreation and the Environment, 2000-2001.

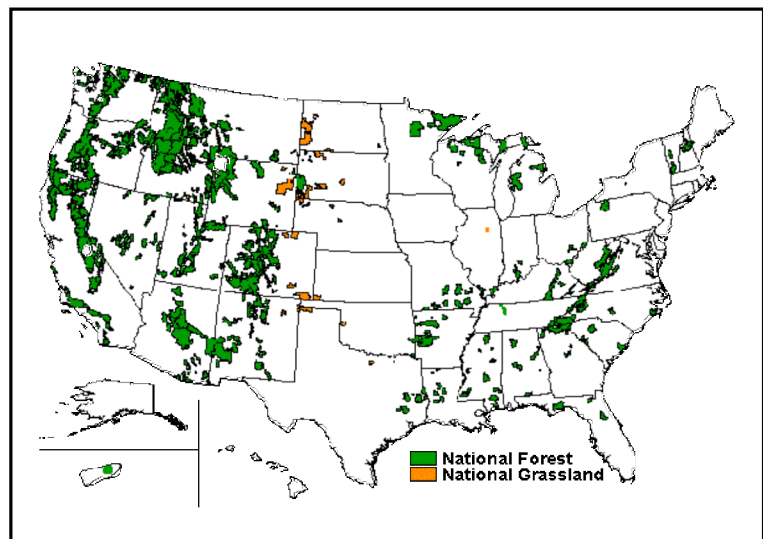
Living within the approximate 2.26-billion-acre area making up the 50 United States in 2000 were 281.4 million people (not counting illegal immigrants). This is a ratio of one person per 8 acres of total land area. Across the United States, there are approximately 2.3 acres of forest land available for recreation per person (Table 35.3). With a much more sparse population and higher total area of public forest land, the Rocky Mountain/Great Plains region has the highest acreage available per person at about 5.7 acres; the population-heavy North has the lowest at 1.2 acres per person.

Table 35.3. National estimates of forest area available for recreation and acres per person , 2002

Region	Area Available (Million acres)	Population (thousands)	Acres per Person
North	143.9	120,651	1.19
South	153.1	91,776	1.67
Rocky Mtns/Great Plains	137.0	23,969	5.71
Pacific Coast	209.2	45,026	4.64
Total United States	643.1	281,422	2.29

Source: Smith et al. 2001 and National Survey on Recreation and the Environment, 2000-2001.

Publicly owned forest lands are an extremely important, and over time, consistent source of outdoor recreation opportunity. In the United States, an estimated 148.5 million of the more than 190 million acres in the National Forest System are forested and available for outdoor recreation (Smith et al. 2001) (see maps at right copied from the national Web site at <http://www.fs.fed.us/recreation/mapfinder.shtml>). About 8 percent of the available National Forest System lands are in the North, more than 8 percent are in the South, almost half are in the Rocky Mountain and Great Plains region, and more than one-third are in the Pacific Coast region, which includes Alaska (Table 35.4). With minor exceptions, the forested portions of the United States' national forest lands are available for recreation by everyone. State forests make up almost 37 million acres of the U.S. land area. More than half of these forests are in the North, 11 percent are in the South, nearly one-fourth are in the Rocky Mountain/Great Plains region, and 11 percent are in the Pacific Coast region. State forests also are available for recreation, with minor exceptions such as seed orchards.



National Forest System for the United States

Table 35.4. Total acres (thousands) and percent of U.S. total of national and State forests available for recreation in the United States by region, 2002

Level of Govt.	North	South	Rocky Mtns	Pacific Coast	U.S. Total
National forests	11,395 7.7%	12,358 8.3%	73,521 49.5%	51,182 34.5%	148,456 100%
State forests	20,188 54.6%	4208 11.4%	8,597 23.3%	3,969 10.7%	36,964 100%

Source: Smith et al. 2001 and National Association of State Foresters, *1998 State Forestry Statistics*. Washington, DC.

Indicator 36. Number and type of facilities available for general recreation and tourism in relation to population and forest area

Direct measures and data are largely unavailable for enumerating number and type of facilities for general recreation and tourism that are specifically in forested settings. While Federal and State agencies maintain data on the sites and facilities they manage, each agency uses different formats and content and none record whether such facilities are forested as defined for the United States sustainable forest management indicators. Thus, except for campgrounds, indirect measures of Federal and State facilities are used for this report for both levels of government. Similarly, secondary data for fully enumerating facilities on private lands nationwide is nonexistent. To estimate facilities on private lands, therefore, questions for an original survey were added to the National Survey on Recreation and the Environment (NSRE) asking respondents who owned forested rural land in one or more tracts of 5 or more acres about recreation access and facilities they offer for outdoor recreation (for more information on the NSRE, go to <http://www.srs.fs.fed.us/trends>).

Reported here for Indicator 6.36 are: (1) number of campgrounds and number of campsites on both public and private forest lands; (2) number of Federal and State areas (e.g., State parks, State forests or national forests) providing facilities for four types of recreation activity (camping, hiking, picnicking and winter sports); and (3) percent of owners and miles of maintained roads and trails provided for recreation on private, nonindustrial lands. Data sources are noted at the bottom of the tables that follow.

Campgrounds and campsites are traditional forest recreation facilities in the United States. Nationally, Woodall's Campground Guide lists 1,137 public and 6,861 private campgrounds. The capacity within those campgrounds include 98,552 public and 766,644 private campsites. By weighting both national and regional counts of campgrounds and campsites by proportion of land area forested (in the county where they are located), we estimated that 1,978 public and private campgrounds in the North are on forested sites, 990 in the South are on forested sites, and 420 and 790 in Rocky Mountain/Great Plains and Pacific Coast regions, respectively, are on forested sites (Table 36.1). Weighting was accomplished by multiplying county-level counts of campgrounds and campsites by proportion of rural natural land area in forest cover (where rural natural land area = total county area minus crop land and urban/developed land). Based on these estimates, it appears that just more than 70 percent the Nation's forested campgrounds and almost 80 percent of its forested campsites are in the two eastern regions (Table 36.1). Only about 10 percent of campgrounds are in the Rocky Mountain/Great Plains region and around 19 percent are in the Pacific Coast region. Roughly 10 percent of the forested campsites in the United States are government provided.

Table 36.1. Estimated number of public and private campgrounds in relation to forest area¹ by region and nationally, 2002

Recreation Facilities	Region				
	North	South	Rocky Mtns/GPs	Pacific Coast	U.S.
Public Campgrounds ¹	220	149	45	115	529
Public Campsites ¹	21,102	11,886	2,930	10,637	46,555
Private Campgrounds ¹	1,758	841	375	675	3,650
Private Campsites ¹	219,303	93,248	28,688	51,002	392,241
TOTAL–Public and Private					
Campgrounds	1,978	990	420	790	4,178
Campsites	240,405	105,134	31,618	61,639	438,796

¹ Data weighted by proportion of county rural, natural land area in forest cover to estimate quantity of facilities in forested settings.

Source: Woodall's Campground Directory, 1996. Woodall Publications Corporation. Ventura, CA. Forest cover source is U.S. Department of Agriculture, Natural Resources Conservation Service, 1997 *National Resources Inventory*.

Table 36.2 shows there are a total of 2,172 national forests, national parks, wildlife refuges, and other Federal areas in the country. Weighting county-level area counts by percent of uncultivated rural area in forest cover for counties across the country provides estimates of number of forest recreation areas, as well as areas offering each of the four different types of opportunities for outdoor activities. As with total acreage, there are many more Federal areas (such as national forests or national parks) in the western regions compared with the eastern regions where most of the United States' public land resides. While almost all Federal areas in the West have some level of recreation access, and facilities, such as campgrounds, trails and day use sites, a smaller proportion of them are forested, compared with the East. Weighted estimates of Federal areas providing camping, hiking, picnicking and snow sport facilities for the four regions and for the United States as a total are shown in Table 36.2. Federal areas providing camping are evenly distributed across the four regions with the two western regions each having 27 percent and the two eastern regions each having more than 20 percent of forested camping areas. The North leads in forest areas that provide hiking with 29 percent. These areas are also quite evenly distributed across the four regions. Even though the West has substantially more Federal land than the East, this is offset by significantly less forest cover in the western regions of the United States. The number of forest areas with picnicking facilities ranges from one hundred sixty three in the South to one hundred twenty in the Pacific Coast. The region with the greatest number of areas with snow sport facilities is the North, followed by the Rocky Mountains and Pacific Coast regions. Overall, 54 percent of Federal forest areas provide camping, 63 percent provide hiking, 61 percent provide picnicking and 22 percent provide snow sport facilities.

Table 36.2. Number of Federal areas providing recreation facilities in relation to forest area by region, 2002

Areas with Facilities	Region				
	North	South	Rocky Mtns/GPs	Pacific Coast	U.S. Total
Total Number of Areas	428	450	837	457	2,172
Estimated Forest Areas ¹	278	226	189	224	917
Forest Areas with Camping ¹	105	116	135	135	491
Forest Areas with Hiking ¹	168	145	123	145	581
Forest Areas with Picnicking ¹	163	136	139	120	59
Forest Areas with Snow Sports ¹	98	6	51	43	198

¹ Data weighted by proportion of county rural, natural land area in forest cover to estimate quantity of facilities in forested settings.

Source: "Recreation.Gov. Recreational Opportunities on Federal Lands," 2002. <http://www.recreation.gov>.

Forest cover source is USDA, Natural Resources Conservation Service, 1997 *National Resources Inventory*.

Table 36.3 lists the number of State parks by region and nationally, and by type of facilities provided. The numbers presented are weighted by county proportion of rural, natural land area in forest cover to show the relationship of parks to forest area. By far, the largest concentration of forested State parks is in the North, followed by the South and Pacific Coast Regions. Roughly 60 percent of the forested State parks are in the populated North. Given the prominence of Federal land in the western two regions, greater numbers of State parks in the East helps balance overall supply of forested recreation areas between the East and West. Roughly half of State park camping, 60 percent of hiking, two-thirds of trail miles, 57 percent of picnicking, and more than 90 percent of snow sport facilities on forested State parks are in the North. Next to the North in providing facilities for forest recreation are State parks in the South, which provide roughly 20 to 30 percent of the Nation's total. Generally around 20 percent of forested State parks with various facilities are in the Rocky Mountain/Great Plains and Pacific Coast Regions. The measure regarding facilities on forested State parks likely to be most replicable in the future is trail miles. As noted earlier, most of these trail miles currently, approximately two-thirds, are found in the North, with another one-fourth found in the South.

Table 36.3 Number of forested State parks providing recreation facilities in relation to forest area by region, 2002

Parks with Facilities	Region				
	North	South	Rocky Mtns/GPs	Pacific Coast	U.S. Total
Total Number of State Parks	1,249	571	363	482	2,665
Forested State Parks ¹	939	331	57	206	1,533
Forested Parks with Camping ¹	490	255	74	149	968
Forested Parks with Hiking ¹	723	274	37	186	1,219
Forested Park Trail Miles ¹	9,762	3,887	392	333	14,375
Forested Parks with Picnicking ¹	763	322	80	183	1,348
Forested Parks with Snow Sports ¹	382	1	23	8	414

¹ Data weighted by proportion of county rural, natural land area in forest cover to estimate quantity of facilities in forested settings.

Source: State Parks database compiled from State Departments of Natural Resource literature and brochures, 1995. Forest Service, Southern Research Station. Forest cover source is U.S. Department of Agriculture, Natural Resources Conservation Service, *1997 National Resources Inventory*.

Table 36.4 provides estimates of millions of acres, percentages of private nonindustrial owners providing overnight and day facilities, and millions of miles of maintained trails and roads available for recreational uses on forested private nonindustrial lands. Greater percentages of owners of private forest lands in the eastern two regions, the North and South, provide day use facilities compared with the West. (The West is not disaggregated into the Rocky Mountains and Pacific Coast Regions because of limited survey sample size.) A higher percentage of western owners, compared with owners in either the North or South, provide overnight accommodations. The much larger private land area to which owners permit recreational access in the East, nearly 196 million acres, represents a very large area compared with about 65 million acres and much smaller numbers of nonindustrial owners over the entire West. Similarly, Eastern owners of private forest provide a much greater number of miles of maintained trails (94 percent of the national total). Likewise, Eastern private forest land owners provide nearly 86 percent of the 8.4 million miles of maintained roads that are available for public outdoor recreation uses.

Table 36.4. Number of overnight and day-use facilities and millions of miles of maintained roads and trails on private nonindustrial lands in relation to forest area by region, 2002

Owners and Miles	Region			
	North	South	West ¹	U.S. Total
Millions of forest acres open	90.7	104.8	64.6	260.1
Percent ownerships with overnight facilities ²	24.1	17.9	30.9	22.5
Percent ownerships with day-use facilities ³	20.4	17.3	13.6	18.2
Millions of trail miles on forested land	2.32	3.60	.41	6.33
Millions of road miles on forested land	2.95	4.26	1.19	8.40

¹ The Rocky Mountain/Great Plains, and Pacific Coast Regions are combined due to limited data sample size.

² Cabins, campsites, or other overnight sites.

³ Picnic, swimming or other day-use facilities.

Source: National Survey on Recreation and the Environment, 2000-2001.

Indicator 37. Number of visitor days attributed to recreation and tourism in relation to population and forest area

Outdoor recreation is a fast growing use of forests in the United States, continuing a trend of steady growth since before the 1950s (Cordell 1999). This country's National Recreation Survey, the NSRE, has indicated that 97 percent of Americans participated at some level in at least one outdoor recreation activity over the 12 months just prior to their being interviewed for that survey (Cordell et al 2002). That percentage translates into approximately 206 million people older than age 15 participating in one or more of the seventy seven outdoor activities listed in the NSRE survey nationwide. Walking is and has continued to be the single most popular of these activities (with 83.8 percent participation). Other activities in the list of the most popular include attending a gathering outdoors with family or friends (73.5 percent); visiting nature centers, nature trails, visitor centers and zoos (57.2 percent); picnicking (55.3 percent); and viewing or photographing natural scenery (54.0 percent).

Table 37.1 shows the ten fastest growing outdoor activities for the year 2001 among the twenty one we have been tracking since the 1983 National Recreation Survey (Cordell et al 2002). It also shows the total number and percent of people aged 16 or older in 2001 who reported participating in at least one outdoor recreation activity in the last 12 months. Growth rates among these activities point to the rapid rise in popularity of trail, motorized, camping and skiing activities. As part of the United States' National Recreation Survey (the NSRE), respondents were asked about participation in forest recreation and as well about the number of days on which they participated in those recreation activities in forest settings.

Table 37.1. The 10 fastest growing activities by percentage change in number of participants aged 16 and over, 1983–2001

Activity	Growth Trend (Percentage)	Millions in 2001	Percent in 2001
Bird watching	235.9	71.2	33.4
Hiking	195.9	73.1	34.3
Backpacking	165.9	23.4	10.9
Snowmobiling	107.5	66.9	31.4
Walking	91.2	179.0	83.8
Off-road driving	89.2	27.9	13.1
Primitive camping	81.9	32.2	15.1
Developed camping	76.0	52.8	24.8
Downhill skiing	66.9	17.7	8.3
Swimming/river, lake, or ocean	64.4	78.1	36.6

Note: All percentages and millions shown are based upon NSRE data collected (n=22,847) up to the time this document was first drafted. As data collection proceeds toward the ultimate goal of 75,000 completed interviews, some of the estimates in this table may change slightly.

Table 37.2 lists estimates of recreation activity days in forest settings (number of different days on which the forest recreation activity was undertaken) by region and by recreation activity, from highest activity days at top to lowest at bottom. Except for walking, numbers of occasions in forest settings were generally greater in the more heavily populated North than in other regions. Not only do high numbers of occasions reflect the high number of residents in this region, but they also reflect substantial forest area in and around this region that is available for recreation. Next highest number of activity days is in the South for most activities, except for snow/ice based activities. Third highest, generally, is the Pacific Coast region, followed fourth by the Rocky Mountain/Great Plains region. Generally, activities involving viewing and photographing natural attributes of forests are among the most actively engaged activities.

An activity occasion can be of any duration from a few minutes to many hours and more than one activity can be engaged during one outing by the same person. For these reasons, the estimates provided in Table 37.2 should be treated as a nonadditive index. If this index is measured consistently over time, it will enable monitoring the flow of apparent recreation benefits from the forests of the Nation. Table 37.2 shows the wide range of recreational activities that occur in forest settings, many more than the traditional view that forest recreation is primarily hunting, fishing and camping.

The trend in participation in the activities listed in Table 37.2 (last column) shows that growth has occurred in all but one of the activities for which estimates of the number of participants for both 1994–95 and 2000–01 were available from the national surveys. (Participation in forested settings was not collected in 1994–95, thus the Trend column in Table 37.2 shows change in number of participants recreating in any setting.) The activity that decreased was sightseeing, which in reality was more or less constant. In terms of numbers of added participants, ranking of activities put walking at the top, adding 46 million participants. Following walking were attending family gatherings outdoors (+36 million), viewing and photographing wildlife (+34), hiking (+24), picnicking (+20), visiting nature centers, museums, etc. (+17), viewing and photographing birds (+16), camping in developed campgrounds (+16), visiting historic sites (+12), and driving motor vehicles off road (+10). Generally, participation in outdoor activities in both forested and nonforested settings continues to grow as it has over the last several decades in the United States. Most of the activities with the greatest amount of growth in numbers of participants are nonconsumptive and of relative low impact on the forest resources.

Table 37.2. Millions of recreation activity days that occur in forest settings by activity and region, 2,000–01¹

Activity	U.S. Total	North	South	Rocky Mtns/ Great Plains	Pacific Coast	Trend 1994–200 1 (millions)²
Walking for pleasure	5,922	1,281	2,131	880	1,194	46
View/photograph scenery	5,148	2,549	1,137	537	831	--
View/photograph birds	3,876	2,288	1,374	189	709	16
View/photograph flowers, trees, etc.	3,295	2,236	591	335	752	--
View/photograph wildlife	2,391	960	978	278	141	34
Day hiking	1,946	749	874	124	423	24
Sightseeing	1,371	587	452	124	187	(1)
Driving for pleasure	1,146	473	622	72	65	--
Mountain biking	1,121	445	385	103	125	--
Visit a wilderness	847	319	271	56	224	--
Warmwater fishing	650	259	373	30	17	8
Drive off-road	610	239	229	79	36	10
Family gathering	592	263	173	50	98	36
Picnicking	566	282	125	48	107	20
Swimming	477	245	156	33	50	--
Visit nature center	470	213	150	37	72	17

Activity	U.S. Total	North	South	Rocky Mtns/ Great Plains	Pacific Coast	Trend 1994–200 1 (millions)²
Developed camping	371	135	122	47	50	16
Horseback riding	351	74	159	44	37	7
Gather mushrooms, berries, etc.	322	249	61	40	66	–
Visit historic site	321	178	64	19	41	12
Coldwater fishing	288	122	55	38	52	9
Big game hunting	216	113	78	22	11	4
Backpacking	188	56	39	28	56	8
Primitive camping	181	42	46	29	66	7
Canoeing	122	64	30	2	33	7
Small game hunting	115	45	36	10	13	3
Downhill skiing	113	68	8	12	20	2
Snowmobiling	101	72	4	15	7	5
Mountain climbing	83	22	20	17	17	4
Rafting	72	32	18	9	10	5
Snowboarding	72	14	(3)	15	18	6
Kayaking	59	25	10	3	21	5
Cross country skiing	42	32	(3)	6	12	2
Anadromous fishing	42	20	7	3	25	1
Orienteering	41	23	10	2	(3)	0
Rock climbing	39	18	4	(3)	(3)	2
Visit prehistoric sites	29	10	1	12	9	--
Snowshoeing	27	20	(3)	2	3	--
Caving	14	5	4	1	6	0

Source: National Survey on Recreation and the Environment, 2000-2001, Versions 1-11, July 1999 to November 2001. Forest Service, Athens, GA.

¹ Regional numbers may not sum to U.S. total because of rounding and because they do not represent a weighted average.

² Activities with a missing value in the trend column did not collect days of participation in the 1994–1995 NSRE.

³ No estimate due to lack of NSRE data for this activity in this region.

In Table 37.3 are reported visits for the year 2000 based on nationwide onsite sampling of U.S. national forest use. The Forest Service has implemented a National Visitor Use Monitoring System (NVUM) that provides statistically valid estimates of recreation visitation (Forest Service 2002). NVUM is intended to be ongoing and if it indeed is, this onsite survey will serve as a valid and consistent data source for Indicator 37 in future years. One fourth of the national forests are statistically sampled within regional strata each year.

NVUM estimates in Table 37.3 show that the largest proportion of national forest use across the country is in general, undeveloped forest areas. In 2001 there were a total of more than 136 million estimated visits to general forest areas on national forests. A site visit is one occasion of any duration where one person enters into an area or site within a single national forest for recreation purposes. Because most of the land area in national forests is in the West, two-thirds of all general forest use is in the two western regions. For developed site day use, more than three-fourths of national use is in the western national forests. Thirty-five percent of overnight developed site use, on the other hand, occurs in eastern national forests, while only 16.0 percent of use of national forest areas in the National Wilderness Preservation System is in eastern wilderness. Comparable use statistics for State forests are generally not available.

Table 37.3. Estimated Site Visits in millions at national forests by Region, Fiscal Year 2001

Region	Site Type			
	Day use on developed	Overnight developed	Designated wilderness	General forest area
North	8.2	2.7	0.9	23.6
South	10.9	4.5	0.8	24.5
Rocky Mtns/ Great Plains	31.7	8.4	5.4	52.5
Pacific	39.0	5.0	3.5	35.9
U.S. Totals	89.8	20.6	10.6	136.5

Source: Forest Service, National Visitor Use Monitoring project.

Current Status and Trends in Cultural, social and spiritual needs and values in the United States—Indicators 42-43

Increasingly in recent years Americans are indicating higher regard for social, spiritual and cultural uses and values of forests and other natural lands (Cordell 2002). Indicators 42 and 43 attempt to measure management of forests that recognizes these values and their increasing importance. With few direct measures available, the report for Indicators 42 and 43 that follows uses mostly indirect measures and some secondary sources.

Indicator 42. Area and percent of forest land managed in relation to the total area of forest land to be protected

The interpretation of the term “managed” for this indicator is taken to mean protection from development that would remove land area previously included in forest inventory, public or private. The two primary sources of protected forest land data used for reporting this indicator are the National Outdoor Recreation Supply Information System (NORSIS) maintained by the Southern Research Station of the Forest Service and the National Survey on Recreation and the Environment (NSRE, <http://www.srs.fs.fed.us/trends/Nsre/nsre2.html>). Both of these data systems are maintained at the Forestry Sciences Laboratory in Athens, Georgia. The NORSIS data system is updated periodically to include areal data describing Federal, State, local and private land and water and their uses. The NSRE, described earlier for Indicator 37, was used to survey owners of private nonindustrial forest land to determine existence of conservation easements as a means of forest protection.

The IUCN World Commission on Protected Areas (IUCN, 1994) defines a protected area as: *An area of land ... especially dedicated to the protection and maintenance of biological (and other) natural and associated cultural resources, and managed through legal or other effective means.* In general, we have adopted this definition for organizing the data for this indicator. In practice, protected areas are managed and in restricted ways used for a wide variety of purposes, such as scientific research, wilderness preservation, maintenance of environmental services, protection of specific natural or cultural features, and education. All of these management objectives are a recognition of various social, cultural or spiritual values. In the text and data treatment that follows, we report the status of the following categories of protected forest:

- Forest protected and used mainly for science
- Forests designated as wilderness
- Forests in national and State parks
- Forested natural monuments
- Forests managed for protection of wildlife habitat and species
- Forests managed mainly to protect landscapes
- Forests managed to sustain long-term social and economic benefits
- Forests protected through conservation easements

Forests protected and used mainly for science. In the United States there is an extensive system of experimental forests with a mixture of ownerships including the Forest Service, State forestry commissions, universities and private industry. Table 42.1 summarizes forest area managed for science as experimental forests, by region. Because of the vastness of western lands and forests, especially in Alaska, the Rocky Mountain and Great Plains and the Pacific Coast regions contain the majority of the experimental forests of the country, almost 71 percent. There are twenty experimental forests in the Pacific Coast Region, thirteen in the Rocky Mountain and Great Plains Region, twenty three in the North, and twenty three in the South (including two in Puerto Rico). Experimental forests are designated to represent specific ecosystems or forest types, and to present opportunities for the study of different approaches to sustaining forested ecosystems and their value.

Table 42.1. Acreage of forest designated as experimental forests in the U.S. and percent of total forest area by region, 2002

Region	Experimental Forest acres	Total acres (thousand) of all U.S. forest land	Percent of total forest protected
North	90,313	169,684	0.05
South	77,039	214,605	0.04
Rocky Mtns/GPs	231,262	144,343	0.16
Pacific Coast	175,031	220,291	0.08
U.S. Total	573,645	748,923	0.08

Source: Forest Service, Vegetation and Protection Management Research Staff, Washington Office, Washington, DC.

Forests designated as wilderness. In 1964 the Congress enacted the Wilderness Act to establish a national system of protected Federal lands intended to keep all included areas wild in perpetuity. Referred to as the National Wilderness Preservation System (NWPS), no other system is managed to such a high degree to protect the natural integrity of the lands designated. Because most of the Federal land is in the West, so too most of the NWPS area is in the West. Of the approximately 106 million acres in the NWPS, just at three-fourths is in the Pacific Coast Region, much of it in Alaska (Table 42.2). About 21 percent is in the Rocky Mountain and Great Plains and the remaining 4 percent is in the East. Congress has designated 628 areas as Wilderness representing mostly mountain and alpine ecosystems in the West and highland and swamp ecosystems in the East. The average size of area in the East is considerably smaller than in the two western regions, some areas being just a few hundred acres.

Acreage of Wilderness was weighted by proportion of rural, nonagricultural, undeveloped area that is forested to estimate forest area protected as Wilderness (Table 42.2). Most of natural land in the North (93 percent) is forested, and about two-thirds of the area protected in the South and Rocky Mountain/Great Plains is forested. Because of large areas of tundra included in Alaska, only 44 percent of wilderness in the Pacific Coast is forested. The Forest Service, National Park Service, Bureau of Land Management and U.S. Fish and Wildlife Service are charged with

managing the areas added by Congress to the NWPS from lands under their respective jurisdictions. Typically, new designations are added by each succeeding Congress resulting in a System that has grown from its original 9 million acres to its current 105 million acres. The future trend will show continuing additions, but likely with smaller acreages than in previous years.

Table 42.2. Area of U.S. forest in the National Wilderness Preservation System, by region, 2002

Region	Acres of forest in the NWPS	Total acres in the NWPS	Percent of NWPS forested	Total acres (thousands) of U.S. forest	Percent of U.S. forest in the NWPS
North	1,399,082	1,504,353	93.0	169,684	0.8
South	1,820,401	2,660,775	68.4	214,605	0.8
Rocky Mountains	14,587,206	21,860,301	66.7	144,343	10.1
Pacific Coast	34,311,101	78,726,909	43.6	220,291	15.6
U.S. Total	52,117,790	104,752,338	49.8	748,923	7.0

Source: The Wilderness Information Network, www.wilderness.net. Managed by the Forest Service, Aldo Leopold Wilderness Research Institute and Arthur Carhart National Wilderness Training Center. Missoula, MT. The National Wilderness Preservation System database is available through a link on that website: nwps.wilderness.net/db/source.cfm. Forest cover source is U.S. Department of Agriculture, Natural Resources Conservation Service, *1997 National Resources Inventory*.

Table 42.3 shows total number of units and acres in the Federal National Wilderness Preservation System by management agency. It also shows acreage with and without the enormous influence of Alaska. The Forest Service (33 percent) and Park Service (42 percent) by far manage the greatest percentages of total national wilderness acreage, both with and without Alaska and Hawaii. The Forest Service manages nearly two thirds of the National System in the contiguous 48 States. Another 58.2 million acres were identified for protection as roadless areas and thus as potential wilderness on national forests by the Clinton Administration in late 2000 (see <http://www.roadless.fs.fed.us>). Over 40 percent of the area in the National Wilderness Preservation System is in Alaska.

Table 42.3. Area of the National Wilderness Preservation System by managing agency, 2002

Agency	Units	Acres	Percent
All areas within the United States			
Bureau of Land Management	133	5,237,800	5.0
Forest Service	400	34,766,995	33.2
Fish and Wildlife Service	71	20,686,134	19.7
National Park Service	44	44,048,239	42.1
TOTAL	628	104,739,168	100.0
Areas excluding Alaska			
Bureau of Land Management	133	5,237,800	11.3
Forest Service	381	29,014,774	62.3
Fish and Wildlife Service	50	2,009,222	4.3
National Park Service	36	10,295,156	22.1
TOTAL	600	46,556,952	100.0

Source: The Wilderness Information Network, <http://www.wilderness.net>.

Forests in national and State parks. The National Park Service was created in 1916 to manage the growing system of national parks in the country. For some States at around that same time, and for many more in following years, State systems of parks were also established. Some of the national parks in the United States are world known for their unique natural features, for example the Grand Canyon in Arizona. Many parks, both Federal and State, have modest forest cover because they are in arid or wetland ecosystems. While most national parks and Federal park acreage is in the West, most State parks and park acreage are in the East. Currently there are around 13 million acres managed as State parks and approximately 77.5 million public land acres in the National Park system, not counting national monuments. Of forested park lands, about 53 percent are in the West (Table 42.4). Overall, nearly 2 percent of forest land in the United States is protected through park management, representing both natural and recreational values.

Table 42.4. Acres of nonwilderness forest protected as national and State parks by region, 2002

Region	Acres of parks forested	Total acres of parks	Percent of park acres forested	Total acres (thousands) of forest land	Percent of forest in parks
North	4,502,398	6,077,160	74.1	169,684	2.6
South	1,397,198	5,942,098	23.5	214,605	0.7
Rocky Mountains	1,926,180	10,502,478	18.3	144,343	1.3
Pacific Coast	6,523,284	24,389,397	26.7	220,291	3.0
U.S. Total	14,349,060	46,911,133	30.6	748,923	1.9

Source: National Park Service. Listing of State and County Acreage by Area, As of 9/30/01. Land Resources Division. Washington, DC. National Association of State Park Directors, *2000 Annual Information Exchange*. Indiana University. Bloomington, IN. Forest cover source is USDA Natural Resources Conservation Service, *1997 National Resources Inventory*.

Note: There are approximately 77.5 million acres in the National Parks system (excluding national monuments) and roughly 13 million acres in State parks. Subtracting national park acreage in the National Wilderness Preservation System (43.5 million acres—about .5 million are in national monument wilderness) leaves a total of 46.9 million national plus State park acres. Also, the low percentage of forested park acres in the South is due to the influence of the Everglades and Biscayne National Parks and Big Cypress National Preserve in Florida, and the relatively light forest cover in Texas. NPs in Florida account for more than half of the non-NWPS South acreage, and less than 10 percent of Texas' NP acreage is forested.

Forested natural monuments. In the United States there are a total of more than 2 million acres that have been designated as natural monuments (Table 42.5). Because these are Federal lands, they lie mostly in the West, of which more than 60 percent are in the Rocky Mountain Region. Only about 20 thousand acres of natural monuments are in the East, 81 percent of which are in the South. Of the national total of natural monument areas, an estimated 19 percent are forested, approximately 400 thousand acres. This is approximately 0.05 percent of total forest area in the United States protected as natural monuments.

Table 42.5. Acres of nonwilderness forest protected as natural monuments by region, 2002

Region	Natural Monument forested acres	Natural Monument total acres	Percent of natural monument acres that are forested	Total acres (thousands) of all U.S. forest land	Percent of all U.S. forest protected in natural monument forest
North	2,156	3,847	56.0	169,684	<0.01
South	8,439	16,574	50.9	214,605	<0.01
Rocky Mountains	158,582	1,280,061	12.4	144,343	0.11
Pacific Coast	230,551	769,183	30.0	220,291	0.11
U.S. Total	399,728	2,069,665	19.3	748,923	0.05

Source: National Park Service. Listing of State and County Acreage by Area, As of 9/30/01. Land Resources Division. Washington, DC. Forest cover source is USDA, Natural Resources Conservation Service, *1997 National Resources Inventory*.

Forest managed for protection of wildlife habitat and species. Both Federal and State agencies manage to protect specific species or habitats. Within the Federal system of land management, the U.S. Fish and Wildlife Service manages a system of National Wildlife Refuges across the country. There are such five hundred thirty eight refuges containing nearly 95 million acres. The system was started in 1903 by President Theodore Roosevelt to protect Florida's last brown pelican rookery from hunters seeking feathers for women's hats. Most States also have a system of wildlife management areas, typically under the jurisdiction of State wildlife and fish commissions. Area and type of habitat under management varies widely from State to State, with many States managing predominantly for hunted species. At the same time, however, State agencies also have nongame programs and participate in rare and endangered species protection programs, sponsored by Federal and private organizations. Inventories using consistent data are generally not available for States. Using the best available data and weighting it to estimate protected forested acres, there are an estimated total of almost 100 million public acres in wildlife protection in the United States (Table 42.6). Of this total national area, nearly 40 percent is forested. Of the protected habitat area in the North, 77 percent is forested. Overall, just more than 5 percent of total forest area in the United States is protected for wildlife values through Federal and State management systems.

Table 42.6. Acres of nonwilderness forest managed for protection of wildlife species or for habitat by region, 2002

Region	Forested Federal/State wildlife area	Total Federal/State wildlife area	Percent of wildlife area forested	Total acres (thousands) of all U.S. forest land	Percent of forest protected
North	12,241,161	15,907,875	77.0	169,684	7.2
South	8,458,427	14,872,820	56.9	214,605	4.0
Rocky Mountains	1,439,851	8,082,243	17.8	144,343	1.0
Pacific Coast	17,265,393	61,021,001	28.3	220,291	7.9
U.S. Total	39,404,832	99,883,939	39.5	748,923	5.3

Source: U.S. Fish & Wildlife Service. *Annual Report of Lands Under Control of the U.S. Fish & Wildlife Service, as of September 30, 2001*. Division of Realty. Washington, DC. Wildlife Management Institute. 1997. *Organization, Authority, and Programs of State Fish and Wildlife Agencies*. Washington, DC. Forest cover source is USDA Natural Resources Conservation Service, *1997 National Resources Inventory*.

Forests managed mainly to protect landscapes. In the United States there are an estimated 786 thousand acres of protected natural seashore or lakeshore (Table 42.7). Weighting these data we estimate that approximately 51 percent of this total (just more than 400 thousand acres) is forested, mostly in the North and South. Nationally, approximately 0.05 percent of all forest lands are protected through management as national seashores or lakeshores.

Table 42.7. Acres of nonwilderness forest protected as natural seashore or lakeshore by region, 2002

Region	Forested natural seashore/lakeshore	Total area of natural seashore/lakeshore	Percent sea/lakeshore forested	Total acres (thousands) of all U.S. forest land	Percent of forest protected
North	202,228	284,737	71.0	169,684	0.12
South	174,316	419,586	41.5	214,605	0.08
Rocky Mountains	0	0	0	144,343	0.00
Pacific Coast	10,946	41,889	26.1	220,291	0.00
U.S. Total	400,289	786,422	50.9	748,923	0.05

Source: National Park Service. Listing of State and County Acreage by Area, As of 9/30/01. Land Resources Division. Washington, DC. Forest cover source is USDA Natural Resources Conservation Service, *1997 National Resources Inventory*.

Note: Includes those units in the National Park System classified as “national seashores” or “national lakeshores.”

Forest managed to sustain long-term social and economic benefits. These protected forests include forested natural systems managed to ensure long-term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services. In Table 42.8, Federal and State lands not covered elsewhere for Indicator 42 are shown. There are a total of more than 450 million acres of Federal and State land not in wilderness, national park, or other special designation in the United States. This is approximately 20 of the total area within the borders of the United States. Mostly these lands are managed by the Forest Service, the Bureau of Land Management, and State agencies. Just more than 45 percent of this land is forested, 77 percent of which is in the West. Of the 23 percent of managed Federal and State forest in the East, two-thirds is in the North, the other one-third is in the South. Overall, 27.5 percent of total forest area in the country is protected as nondesignated, managed public forests. Over 60 percent of total forest area in the Rocky Mountain Region is protected as managed public forest.

Table 42.8. Acres of nonwilderness land managed to protect their long-term status as forests and to provide both commodity and noncommodity values and benefits

Region	Other Federal/State forests	Total other Federal and State acres	Percent of total forested	Total Acres (thousands) of all U.S. forest land	Percent of U.S. forest protected
North	30,546,693	31,256,619	98.3	169,684	18.0
South	16,469,665	17,277,404	95.2	214,605	7.7
Rocky Mountains	89,870,184	229,063,992	38.8	144,343	62.3
Pacific Coast	71,402,515	172,860,672	40.0	220,291	32.4
U.S. Total	205,150,221	450,458,687	45.5	748,923	27.8

Note: Forested acres identified above may be viewed as that remaining after removing all other designated Federal and State land enumerated in Tables 42.1 through 42.6. Mainly these forest lands are those managed by the Forest Service, the Bureau of Land Management and State forestry commissions.

Forest protected through conservation easements. The final measure used for Indicator 42 is estimated percentages and acres of private nonindustrial forest lands under protection through conservation easements with local government or with private organizations. In Table 42.9, estimates of protected forest acres as reported by landowners shows significant participation by landowners. Through agreements with either State or local governments, across the United States, it is estimated that 7.8 percent of private forest land is protected. Through private organizations, the protected percentage is 0.6 percent. Combined across the country, 8.4 percent of private nonindustrial forest land as reported by a sample of owners is protected and the average acres protected per forest land owner participating in an easement program is 25.1 acres. Overall, an estimated 29.3 million acres of nonindustrial private forest land is protected through easements with local/State agencies or private organizations. 92 percent of this acreage is protected through agreements with local or State governments.

Table 42.9. Percent and area of private, nonindustrial forest land in the United States reported by owners as protected under local conservation easements, 2001

Estimated Parameter	U.S. Totals
Percent protected with local government	7.8
Percent protected with private organization	0.6
Overall percent protected	8.4
Mean acres protected per owner participating	25.1
Millions of acres under local government easement	27.1
Millions of acres under easement with a private organization	2.2
Total nonindustrial private forest under conservation easements	29.3

Source: National Survey on Recreation and the Environment, Version 11, July 2001 to November 2001. Forest Service, Athens, GA.

Indicator 43. Nonconsumptive forest values

This indicator is intended to measure nonconsumptive uses and values of forests that do not result in the physical removal or destruction of natural forest materials. Direct data sources are limited, but measuring nonconsumptive forest uses and values is highly important as an acknowledgment of rising interest in them among Americans and achieving balanced forest management on both public and private lands. Indirect measures here reported include:

- Nonconsumptive recreation activity occasions, an indication of nonconsumptive recreation values (the estimates of activity occasions reported are the same as those reported for selected activities in Table 37.2)
- Percentages of the population age 16 years or older indicating one of four values of public forests as most important
- Percentages of the population 16 years or older indicating one of four values of privately owned forests as most important
- Percentages of the population 16 years or older indicating for each of 12 values of national forests, which are extremely important, and
- Average consumer surplus values for nonconsumptive outdoor recreation activities that occur in forest settings.

All of these measures are computed from survey data gathered through the U.S. National Survey on Recreation and the Environment (NSRE, <http://www.srs.fs.fed.us/trends/Nsre/nsre2.html>). The last three measures described above will serve as baseline measures for future Montreal Indicator reporting where replicated survey protocols can be implemented to measure the level of public satisfaction that forests are being managed effectively to sustain values they have indicated to be important.

In Table 43.1, millions of recreation activity occasions in forest settings for 33 nonconsumptive outdoor activities are shown for the United States as a whole and for each of four regions. Walking for pleasure, viewing and photographing scenery, viewing and photographing birds, viewing and photographing flowers, and viewing and photographing wildlife are the 5 activities with the greatest number of participation occasions, each with more than 2 billion for a 12-month period. The second tier of activities, with between one and two billion occasions each, include day hiking, sightseeing, driving for pleasure, and mountain biking. Immediately following these four activities is visiting a wilderness or primitive area. The four activities with the least participation include orienteering, rock climbing, visiting a prehistoric site, and caving (sometimes called “spelunking”). Millions of activity occasions and thus proportion of national totals vary considerably by region, depending mainly on regional population size, availability of opportunities and climate.

Trends in numbers participating in the activities in Table 43.1 were shown in Table 37.2 and discussed under Indicator 37. Generally the trend was growth between 1994–95 and 2000–01. The activity at the top was walking for pleasure (+46 million), followed by attending family gatherings outdoors (+36), viewing and photographing wildlife (+34), hiking (+24), picnicking (+20), visiting nature centers, museums, etc. (+17), viewing and photographing birds (+16), camping in developed campgrounds (+16), visiting historic sites (+12), and driving motor vehicles off road (+10). Generally, participation in outdoor activities in both forested and nonforested settings continues to grow in the United States, reflecting increasing recreational value of forests.

Table 43.1. Total number of recreation activity occasions that occur in forest settings by region, 2000–2001 (millions)

Activity	U.S. Total	North	South	Rocky Mtns	Pacific Coast
Walking for pleasure	5,922	1,281	2,131	880	1,194
View/photograph scenery	5,148	2,549	1,137	537	831
View/photograph birds	3,876	2,288	1,374	189	709
View/photograph flowers, etc.	3,295	2,236	591	335	752
View/photograph wildlife	2,391	960	978	278	141
Day hiking	1,946	749	874	124	423
Sightseeing	1,371	587	452	124	187
Driving for pleasure	1,146	473	622	72	65
Mountain biking	1,121	445	385	103	125
Visit a wilderness	847	319	271	56	224
Drive off-road	610	239	229	79	36
Family gathering	592	263	173	50	98
Picnicking	566	282	125	48	107
Swimming	477	245	156	33	50
Visit nature center	470	213	150	37	72
Developed camping	371	135	122	47	50
Horseback riding	351	74	159	44	37
Visit historic site	321	178	64	19	41
Backpacking	188	56	39	28	56
Primitive camping	181	42	46	29	66

Activity	U.S. Total	North	South	Rocky Mtns	Pacific Coast
Canoeing	122	64	30	2	33
Downhill skiing	113	68	8	12	20
Snowmobiling	101	72	4	15	7
Mountain climbing	83	22	20	17	17
Rafting	72	32	18	9	10
Snowboarding	72	14	-- ¹	15	18
Kayaking	59	25	10	3	21
Cross country skiing	42	32	-- ¹	6	12
Orienteering	41	23	10	2	-- ¹
Rock climbing	39	18	4	-- ³	-- ¹
Visit prehistoric sites	29	10	1	12	9
Snowshoeing	27	20	(1)	2	3
Caving	14	5	4	1	6

Source: National Survey on Recreation and the Environment, 2000-2001, Versions 1-11, July 1999 to November 2001. USDA Forest Service, Athens, GA.

¹ No estimate due to lack of NSRE data for this activity in this region.

Table 43.2 includes estimates of the percentages of U.S. and regional populations indicating which one of four values is most important in the management of public sector forests. Nationally and in all regions, clean air and water is identified as the most important value for public forest management by more than 50 percent of the populations sampled. Scenic beauty is identified as the second most important public forest value by way of the second highest percentage, followed closely by management of public forests for cultural and natural heritage values. Nationally and in all regions, management for wood products had the lowest percentages as most important public forest value. The largest percentage placing clean air and water as most important was in the South and lowest in the Rocky Mountain and Great Plains region. The Rocky Mountain and Great Plains population placed wood products and cultural and natural heritage values higher than did any of the other regions.

Table 43.2. Percent of U.S. population 16 or older indicating one of four values is most important in management of public forests by region

Value	Percent by Region				
	National	North	South	Rocky Mtns	Pacific Coast
Clean air and water	58	59	61	50	58
Scenic beauty	19	21	16	17	18
Cultural and natural heritage	14	14	13	20	13
Wood products	5	3	6	10	5
No response	4	3	4	3	6

Source: National Survey on Recreation and the Environment, Version 4, February 2000 to July 2000. Forest Service, Athens, GA.

Table 43.3 includes estimates of the percentages of the U. S and regional populations indicating which one of the four values listed they felt was most important in the management of private sector forests. As with public forests, clean air and water were identified as most important by the highest percentage of respondents, above scenic beauty, heritage or wood products. However, for private forest management, clean air and water was identified as most important by significantly smaller percentages of respondents than selected this value as most important for public forest management. As well, percentages indicating scenic beauty and cultural and natural heritage values as most important for private forest management were smaller than for public forests, as reported in Table 43.2. Compared with most important values for public forests, management for wood products was the most important value of private forests to much larger percentages. Discrepancies across regions were much less pronounced and statistically nonsignificant for all four values for management of private forests relative to regional differences for values of public forest management.

Table 43.3. Percent of U.S. population 16 or older indicating one of four values is most important in management of private forests by region

Value	Percent by Region				
	National	North	South	Rocky Mtns	Pacific Coast
Clean air and water	48	48	52	44	46
Scenic beauty	14	13	14	14	14
Cultural and natural heritage	10	11	9	11	9
Wood products	20	22	18	19	18
No response	8	6	7	12	13

Source: National Survey on Recreation and the Environment, Version 4, February 2000 to July 2000. Forest Service, Athens, GA.

Table 43.4 shows estimates of percentages of the U.S. and of regional populations who indicated from a Likert scale ranging from 1 to 5 which values they felt were not at all important to extremely important to emphasize in management of U.S. national forests. Shown in the table are percentages indicating each value is important or extremely important. National forests, as administered by the Forest Service, are found throughout the country, but particularly in the Rocky Mountain and Pacific Coast States. The values that the greatest percentages nationally and across regions selected as important to extremely important included protection of streams and other sources of clean water, management to assure healthy forests for future generations, protection of habitat for abundant wildlife and fish, protection of habitat for rare and endangered plant and animal species, and management to keep national forests natural in appearance. Values that the lowest percentages selected as important to extremely important included providing recreation opportunities, development of roads and facilities for tourism, issuing permits to enable grazing of private livestock, and providing access to raw materials for local industries. Little variation is evident across regions for any of the 12 values shown.

Table 43.4. Percentages of population 16 or older indicating the value listed is extremely important to emphasize in the management of U.S. national forests by region

Value that management should emphasize	U.S. overall	Region			
		North	South	Rocky Mtns/ Great Plains	Pacific Coast
Clean water	84	85	84	81	80
For future generations	81	81	81	79	83
Wildlife and fish habitat	70	70	70	72	73
Rare and endangered species	68	68	69	63	70
Natural in appearance	65	66	64	66	65
Timber supply	59	58	61	60	55
Information and education	53	52	56	51	53
Natural places for personal renewal	50	50	53	47	48
Recreation	45	43	50	47	42
Roads and tourist services	32	29	36	30	33
Grazing livestock	29	28	31	31	27
Raw materials for industry	26	24	29	25	27

Source: National Survey on Recreation and the Environment, Version 4, February 2000 to July 2000. Forest Service, Athens, GA.

In Table 43.5, means of estimates of consumer surplus values per activity day per person (per participant) are shown, along with ranges of estimates from studies done in the United States between 1967 and 1996. Consumer surplus estimates of economic value indicate the net benefit to recreation participants above what they have paid for transportation, access fees and other costs. Highest values have been estimated for snowmobiling, nonmotorized boating (such as kayaking), rock climbing, and biking (including mountain biking). Lowest estimated values were for horseback riding, off-road driving of motor vehicles, swimming, cross-country skiing, and downhill skiing. Values across activities range from a low of \$15.10 to a high of \$69.97. Ranges of estimates across studies for any given activity vary widely indicating a diversity of settings, quality of experience opportunities, methods used to derive the estimates and other factors. Overall, means estimates seem to vary around a median of about \$35 per person per activity occasion.

Table 43.5. Summary statistics on average consumer surplus values per activity day per person from recreation demand studies – 1967 to 1998 (fourth quarter, 1996 dollars)

Activity	Mean of estimates	Range of estimates
Camping	30.36	\$1.69–187.11
Picnicking	35.26	7.45–118.95
Swimming	21.08	1.83–49.08
Sightseeing	35.88	0.54 –174.81
Off-road driving	17.43	4.37–33.64
Motorized boating	34.75	4.40–169.68
Nonmotorized boating	61.57	15.04–263.68
Hiking	36.63	1.56–218.37
Biking	45.15	17.61–62.88
Downhill skiing	27.91	12.54–52.59
Cross-country skiing	26.15	11.70–40.32
Snowmobiling	69.97	36.23–103.70
Wildlife viewing	30.67	2.36–161.59
Horseback riding	15.10	15.10–15.10
Rock climbing	52.96	29.82–85.74
General recreation	24.26	1.18–214.59
Other recreation	40.58	4.76–172.34

Source: Rosenberger, Randall S. and John B. Loomis. 2001. Benefit transfer of outdoor recreation use values. RMRS-GTR-72. Fort Collins, CO: Forest Service, Rocky Mountain Research Station. p. 4.

Comment on Data Measuring Level of Management to Sustain Cultural Values (By Joseph Tainter, Forest Service Research—Comments pertaining mainly to data for national forests.)

In 1966, Congress passed the National Historic Preservation Act (NHPA), which directed Federal agencies to manage historic resources in a spirit of stewardship for future generations. NHPA initially appealed to three groups with long-standing interests in historic preservation: those concerned to preserve places significant in American history, architectural history, and archaeology. Encouraged by Executive Order 11593 (1971), which directed agencies to comply with NHPA, the Federal Government in the 1970s began to employ archaeologists in increasing numbers. Since much of historic preservation involved archaeology, agencies employed comparatively fewer historians and architects. Historic or heritage management in the Federal government, including the Forest Service, came thus to be the domain largely of archaeologists, who sought to preserve cultural sites primarily for their research value, and secondarily for their value in public interpretation. Not many years passed, though, before it became apparent that other groups also had interests in historic sites. Prominent among these groups are American Indians, who often feel an ancestral connection to archaeological sites, and who in some cases believe historic sites to be living organisms at which the ancestors still reside. Others who feel that they have connections to archaeological sites on Federal lands include immigrant ethnic communities (such as Chinese-Americans), descendants of Euro-American settlers, ranchers and other commodity producers, recreationists, and practitioners of so-called “New Age” religions. This is not an exhaustive listing.

As these interest groups emerged, it often fell to agency archaeologists to address their concerns. To reflect this growing diversity of purpose, in the 1990s the Forest Service’s historic preservation effort changed its designation from Cultural Resource Management to the Heritage Program. Today this program remains on many forests the contact point for a diverse range of cultural, social, and spiritual interests regarding forest lands. The Heritage Program is the primary program that has maintained records or databases that could potentially address this indicator. Other agency programs will certainly have information on public activities, especially Recreation and Special Uses, but the Heritage Program will have the most comprehensive picture of dispersed activities fulfilling cultural or spiritual needs. Heritage Program databases are pertinent for two further reasons: (1) archaeological and historical sites are often locations to which people ascribe cultural, social, or spiritual values; and (2) these databases are legally exempt from the Freedom of Information Act, which is especially important for sensitive cultural information. Nonetheless, it might be productive to explore records or databases in other agency programs for information pertinent to this indicator.

There is a wide range of cultural, social, and spiritual values that people perceive in forest lands. Of these, “social” needs and values are the most difficult to pinpoint, for this term could potentially include all of forestry. Most social needs and values will be incorporated within other indicators of Criterion 6. Therefore the emphasis here is on cultural and spiritual needs or values.

The cultural resources on forest lands in which people perceive cultural, social, or spiritual values range from large tracts of land (e.g., entire mountains), to individual archaeological sites

or groups of sites, to individual objects (e.g., a prehistoric arrowhead valuable in a contemporary Indian ceremony), to locations that have no identifying physical characteristics. In the discussion that follows, these places are referred to by such terms as “area,” “site,” “property,” and the like. For this discussion, these terms are meant generically to denote places where people perceive cultural, social, or spiritual values.

Indicator Usefulness and Wording

As worded, the indicator does not measure or monitor sustainability. The term “area and percent of forest land” can measure only the degree to which resources valuable for cultural, social, or spiritual reasons have been recognized. Recognizing such resources or areas is the first step, but does not indicate whether they are being managed in a sustainable manner. Moreover, it is not clear how one would interpret changes in the indicator over time. Do increasing values necessarily indicate greater sustainability? This is perhaps not so. Consider, for example, the following possibilities.

1. Over time a national forest (or all national forests in aggregate) recognizes more areas to protect for cultural, social, or spiritual values. Funding to manage these areas remains constant, or does not increase proportionately. Funding per resource or area therefore declines. There is proportionately less money to manage the larger resource. Although the indicator shows increasing values, sustainability has actually declined. Use of the indicator would give misleading results.
2. Aggregated numbers may conceal important variation. If, for example, Forest A finds that 20 percent of its land should be managed to protect cultural, social, or spiritual values, it will contribute importantly to national figures. Forest A may, however, manage such areas poorly. Forest B, on the other hand, may recognize only 10 percent of its land as having cultural, social, or spiritual values, but manages those areas well. Forest B’s resources are managed in a more sustainable manner, yet it contributes to the aggregated national figures less than does Forest A. Again, higher values do not indicate sustainability. To measure sustainability, the relative contribution of each forest to aggregated national figures should be the opposite of what it actually is.
3. If funding (or other institutional rewards) should increase based on values reported in the indicator (counting only gross area, or percentage of area), then the indicator gives national forests an incentive to find more areas having cultural, social, or spiritual values. Marginal or questionable areas may come to be included. Moreover, the incentive is only to find and report such areas, not to manage them well. Given such an incentive, there is no reason for sustainability to increase with increasing values of the indicator.

Clearly it is essential to measure not only how fully areas with cultural, social, or spiritual values have been recognized, but also how well they are managed. Areas or properties to which we ascribe cultural, social, or spiritual values are, like all phenomena, subject to the Second Law of Thermodynamics. They degrade, and so must be maintained. Degradation consists of obvious factors such as erosion, fire, vandalism, or decay of structures. Degradation also consists of processes that are more subtle. American Indian ceremonies, for example, are often secret and

require seclusion. It may be impossible to conduct a ceremony if the location where it is conducted is intruded upon by a housing development, a road, a timber sale, or even casual hikers. Such a ceremony may be known to only one person, and if the ceremony cannot be conducted it will not be passed on. That part of the cultural tradition dies.

Sustaining areas to which people ascribe cultural, social, or spiritual values consists both of recognizing such areas, and of maintaining the qualities in which people find value. Maintenance may consist of such activities as preventing looting, vandalism, or casual collecting of artifacts; stabilizing or repairing structures; arresting erosion; retaining visual quality; maintaining habitat or condition of vegetation; or preventing encroachment by incompatible uses. Failure of such maintenance means that the usefulness of the area declines, and it can no longer sustain the values that people perceive.

Given these considerations, Indicator 42 of Criterion 6 might be reworded as follows.

(1) Percent of forest land that has been investigated to professional standards for the presence of areas, sites, or objects ascribed cultural, social, or spiritual values; *and* (2) integrity of areas, sites, or objects that have been ascribed cultural, social, or spiritual values.

Variables to Monitor and Databases

Given that monitoring for sustainability consists substantially of monitoring condition, a database to track Indicator 42 would usefully contain the following entries.

1. Percent of national forest inventoried to standard.

2. Status of Cultural Properties.

National Register of Historic Places property type.

Location (national forest).

Size.

Type (e.g., prehistoric, historic, multicomponent) and age.

Status on National Register of Historic Places, or on State register, and eligibility criterion if applicable.

Allocation values.

User groups (known or potential).

Structural remains and types.

Condition.

Monitoring schedule.

Deterioration threats.

Actions to arrest deterioration and/or restore.

Explanation and Rationale

1. Percent of national forest inventoried to standard. Standards may be those of the National Park Service or State historic preservation offices. The figures for individual national forests can be aggregated to report a national figure.

2. Status of Cultural Properties.

Property type. The types of properties recognized by the National Register of Historic Places include districts, sites, buildings, structures, and objects. Other categorizations can be developed.

Location (national forest). For national sustainability monitoring, only the national forest needs to be known, not specific location.

Size. Self-explanatory.

Type (e.g., prehistoric, historic, multicomponent) and age. A professional team representing all regions should develop categories.

Status on National Register of Historic Places, or on State register, and eligibility criterion if applicable (listed; determined eligible; not formally evaluated but managed as if eligible; determined not eligible; not evaluated).

Allocation values. In 1983, the Forest Service Southwestern Region established a set of uses to which cultural properties might be allocated (Green and Plog 1983). The categories were (a) interpretation, (b) information (i.e., research value), (c) heritage (contemporary cultural, social, or spiritual value), and (d) adaptive reuse/continuing use. Since such a scheme gives an indication of the purpose of management, it may be desirable to develop a similar, or expanded, system nationally.

User groups (known or potential). This category helps to clarify the purpose of management. Properties valuable primarily for scientific research may be managed differently from those valuable to a specific social or cultural group. This variable would best be taken from an established list, which would need to be expanded from time to time.

Structural remains and types. A look-up table might be established for this variable.

Condition. This should be a look-up value, with the option to attach a descriptive memo. It is necessary to provide a field to update condition, so that it can be tracked.

Monitoring schedule. Self-explanatory. Whether the monitoring schedule is adhered to is one measure of sustainability. Provide links to report numbers.

Deterioration threats. This should be a look-up value, with a memo field for narrative description. Provide a field to update.

Actions to arrest deterioration and/or restore. This should be a look-up value, with a memo field for narrative description. Provide links to report numbers.

Not all of these variables would need to be aggregated nationally. Some would be useful for monitoring sustainability by regions and national forests.

Status of Data Sources

For reporting under the Montreal Process, the above data would be easiest to collect if kept in a national database. Reporting based on regional databases would also be easy. Aggregating from forest or State databases would be difficult and inconsistent.

In July 2001, the regional heritage preservation officers were queried about databases in their regions that could address sustainability monitoring. The responses indicate that there are currently no databases of cultural resources that could address Indicator 42, at the national level, according to the rewording suggested here. Region 5 (California) maintains a tabular database, but it is incomplete (1,800 of 52,000 sites by the end of fiscal year 2001). In some regions, national forests maintain databases. In some cases, States maintain databases, but these tend naturally to be variable. In some regions, forests still maintain data files largely on paper. Some information is reported each year to the Department of the Interior, but not sufficient fully to address questions of sustainability. Thus there are currently no cultural databases to monitor Indicator 42 at the national level.

Fortunately there are efforts underway that may remedy this situation in the next few years. The major effort is NHIMI—the National Heritage Information Management Initiative. This effort at creating a national database of heritage resource information was initiated by the Washington Office (Recreation, Heritage, and Wilderness Resources), and is being developed by a national team. Regions 2 (Rocky Mountain) and five have had prominent roles in this effort. According to Heather Busam of Region 5 (personal communication, 12/7/2001), NHIMI will capture much of the information recommended here for sustainability monitoring. NHIMI is a module of the larger INFRA (infrastructure) database effort. Other pertinent information may be captured elsewhere in INFRA, which associates activities with costs under the program labeled “Meaningful Measures.” If any of the information recommended here is not captured by NHIMI,

National Forest Systems may wish to consider adding additional data fields, as necessary. A great amount of backlogged data must be entered in NHIMI before it is useable. It is presently anticipated that sample data will be available in NHIMI by 2004, and all backlogged data by 2006. Thus, within a few years, the Forest Service may have a tool to monitor and report an improved version of Indicator 42.

It is important to note, though, that much information about cultural and spiritual uses of forest lands is considered confidential or secret, especially by American Indians. They are often reluctant to disclose such information to outsiders. If they develop a relationship of trust with a specific Forest Service employee, they may disclose some information to that person, but with the expectation that it will not be disclosed to others. Thus, there will always be much information on cultural, social, or spiritual uses of forest lands that the Forest Service never obtains, or if it is obtained, will not be entered into electronic databases. NHIMI, or any other database, will always underrepresent such areas. A further consideration is that some groups may not wish to see formal maintenance of areas that they consider important. Some users prefer that the area or property be allowed to degrade naturally. Thus, Forest Service conceptions of sustainability may conflict with the wishes of specific groups of users. Such subtleties can never be captured in aggregated national statistics.

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